



annual report  
CLEMSON COLLEGE  
1950

This aerial view shows a part of the farm machinery which covered Bowman Field during Farmers' Week. An estimated \$1,000,000 worth of equipment was displayed by commercial exhibitors. Farm people from all counties of the state come to Clemson for this annual affair and have an opportunity of attending lectures and demonstrations on the latest in modern agriculture.

SIXTY-FIRST ANNUAL REPORT  
of the  
BOARD OF TRUSTEES  
of  
THE CLEMSON AGRICULTURAL COLLEGE  
to the  
GENERAL ASSEMBLY OF SOUTH CAROLINA  
1950

---

**RECORD**  
**The Clemson Agricultural College**

---

Published quarterly by The Clemson Agricultural College, Clemson, S. C.  
Entered as second class matter April 25, 1905, at the Post Office at  
Clemson, S. C., under the Act of July 16, 1894, now superseded  
by the Act of August 24, 1912.



## LETTER OF TRANSMITTAL

To the Members of the General Assembly  
Columbia, South Carolina

Gentlemen:

The trustees of The Clemson Agricultural College are pleased to transmit herewith for your thoughtful consideration the Report of President R. F. Poole for the fiscal year July 1, 1949 to June 30, 1950.

Members of the Board have reviewed the affairs of the several agencies of the college on three occasions during the past year and have found them entirely satisfactory.

Respectfully submitted,

Christie Benet,

President, Board of Trustees

December 1, 1950



## TABLE OF CONTENTS

---

REPORT OF THE PRESIDENT .....	5
REPORT OF THE TREASURER .....	14
REPORT OF BOARD OF VISITORS .....	20
REPORT OF DIRECTOR OF DEPARTMENT OF FERTILIZER INSPECTION AND ANALYSIS .....	24
REPORT OF DIRECTOR OF LIVESTOCK SANITARY DEPARTMENT .....	26
REPORT OF STATE CROP PEST COMMISSION .....	30
REPORT OF DIRECTOR OF EXPERIMENT STATION .....	36
REPORT OF DIRECTOR OF EXTENSION SERVICE .....	50

**REPORT OF THE PRESIDENT OF THE COLLEGE**

From R. F. Poole  
President, The Clemson Agricultural College

To the Honorable Christie Benet  
President, The Board of Trustees

I have the honor to present to you the sixty-first report of the President of Clemson College. In addition to the reports of the public service activities, I am including short summaries of the work of the various schools of the college.

In 1949-50 there were 3360 students enrolled in the first semester and a total enrollment of 3522 for the year. Thus far this session we have enrolled 2921 students.

The reduction in enrollment has been due to (a) the large graduating class of 773 in 1950, (b) the reduction in total veteran enrollment from 1620 last fall to 995 at the present time, (c) the Korean situation and the calling of many veterans in the reserves to active duty.

The increase of non-veterans or cadets has not been sufficient to offset the decrease of veterans in the total enrollment.

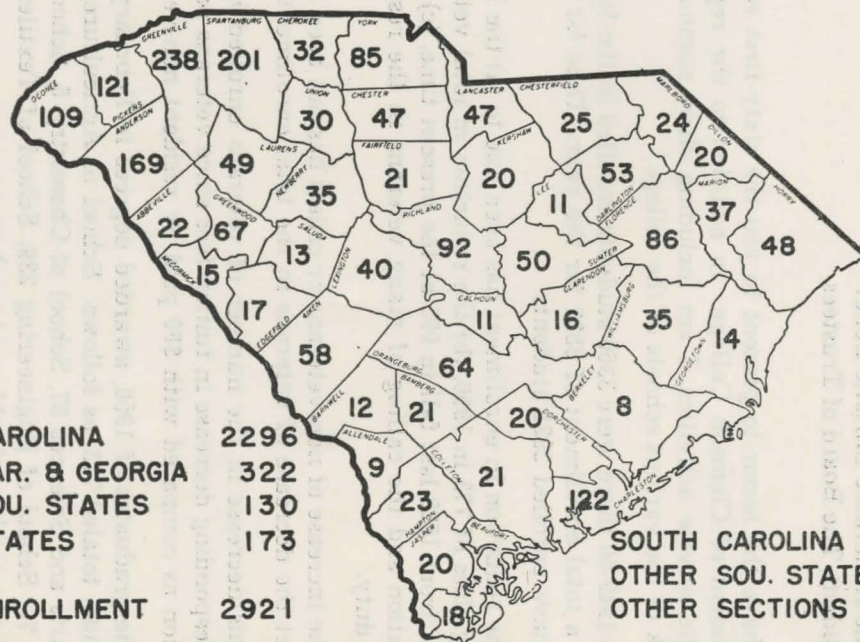
This decrease in the number of veterans enrolled has meant a corresponding decrease in tuition fees since veterans pay \$250 each session as compared with \$80 paid by resident non-veterans.

The graduates of 1950, awarded degrees in February, June, and August, totaled 773, as follows: School of Agriculture 154, School of Arts and Sciences 87, School of Chemistry 6, School of Education 76, School of Engineering 239, School of Textiles 216. Five students received double-majors degrees.

The enrollment of 2921 students this semester includes 2832 undergraduate students who are majoring in the various schools as follows: Agriculture 738, Arts and Sciences 217, Chemistry 32, Education 282, Engineering 885, Textiles 678. It is estimated that more than 60 graduate students will be enrolled during the year.

# WHERE THE CLEMSON STUDENTS COME FROM

FIRST SEMESTER 1950 - 1951



SOUTH CAROLINA	2296
NORTH CAR. & GEORGIA	322
OTHER SOU. STATES	130
OTHER STATES	173
<b>TOTAL ENROLLMENT</b>	<b>2921</b>

SOUTH CAROLINA	78.6%
OTHER SOU. STATES	15.5%
OTHER SECTIONS	5.9%



Of the present enrollment 78.6 per cent of the students are from South Carolina, 15.5 per cent from other southern states, and 5 per cent from other sections.

Although student enrollment in the **School of Agriculture** has declined somewhat, the number electing agricultural majors continues relatively high. The courses offered in agriculture are designed to provide training which will fit young men for careers in either the professional or the commercial field. The subjects covered include the production of the different agronomic and horticultural crops, the care and management of the different classes of livestock and poultry, agricultural engineering, the chemical, botanical, and social sciences which underlie a successful system of farming. The instruction in these subjects is planned to fit students for practical farming, for such positions as that of teacher, investigator, or extension worker, and for service in a wide variety of commercial pursuits related to agriculture. That this instruction is effective is attested by the generally favorable reaction towards Clemson agricultural graduates in commercial organizations with which they are associated or at other institutions where they go to pursue graduate work.

With the relatively heavy enrollment during the last few years, classrooms and laboratories have been crowded. Should larger numbers elect agriculture in the future, some special provision for additional space will be necessary as well as additional educational equipment.

Because each year the **School of Arts and Sciences** is serving almost all students enrolled, it has the majority of teacher-student contact hours in the college. The principal function of this school is to teach all Clemson students mathematics, English, physics, foreign languages, and the social sciences. Training in these fields is needed by students as the basic foundation for specializing in various professional fields and as broadening general education which is essential for the educated man. Because other schools of the college are primarily concerned with technical training, it is the School of Arts and Sciences that gives to students their training in the subjects that develop what we call Americanism and the broadening education that enables a man to become an executive rather than a technician.

Besides teaching nearly all the students in the college, the School of Arts and Sciences sponsors three major courses, utilizing facilities already necessarily established at the college.

The major in Pre-medicine is particularly fortunate in having available work in the natural sciences necessarily provided for other fields here but not generally found at other institutions in the state.

The major in Industrial Physics is training students for service in the industrial world in this field in which the national supply is very limited.

The major in Arts and Sciences is provided for those who wish to attend Clemson and who want a good general education rather than specialized technical training.

In the Physics Department, addition of some modern equipment and acquisition of a considerable volume of war surplus equipment has made possible participation of individuals in research activities as well as improved teaching facilities. Several members of the Physics staff are engaged in research problems mostly directly connected with research problems in agriculture or textiles; e.g., the physicists have used the electron microscope in research on soils in cooperation with studies in progress in the Agricultural Experiment Station.

The employment of sufficient and adequately qualified staff personnel in the School of Arts and Sciences has been very difficult particularly because of salary competition with other institutions, the government, and industry. Members of the staff are making special effort to improve themselves for their work. Twelve members are on extended leave without pay studying at universities towards the Ph.D. degree, and others are doing graduate study in the summers.

One serious handicap of the School of Arts and Sciences in performing its proper function is the great lack of building space.

Although registration in the college as a whole was somewhat less this fall, no appreciable decrease was noted in the **School of Chemistry**. The first Master of Science in Chemistry degree was awarded in June, and three more candidates for that degree are registered this fall, bringing the total to nine.



The calls for chemists by organizations in this state are increasing steadily as more chemical industry moves into the state. None of our graduates are available for vacant positions which are now on file, and this situation will become more acute as more and more men are taken into the armed forces.

Two of the permanent staff of the School of Chemistry are now on academic leave studying in other southern institutions, completing work for the Ph.D. degree. When they return, over half of the school's permanent faculty will have the Ph.D. degree.

It is very fortunate that the contract for the new Chemistry Building was awarded when it was. As soon as the Korean situation arose, not only did prices for building materials start rising drastically but many materials became almost unobtainable. It was necessary to eliminate many items in the original specifications to bring the cost down to the low bid. The items that were cut were those that can be most economically replaced when funds are available. When completed and equipped, the new building will be the equal of any in the state.

**The School of Education** has had one of its finest periods since June 1950. About 100 graduate students received almost full-time attention of some of the school's faculty during the summer. This included a visiting professor who has been well trained at leading institutions and widely experienced and who is now superintendent of the Anderson, South Carolina school system, Mark F. Hawthorne. Through the cooperation of the State Department of Education, State Director Mark Nichols of Utah worked with teachers in the development of training for young farmers. The head of the Department of Vocational Agricultural Education, in cooperation with the heads of departments of the Agricultural Experiment Station, gave graduate work in which the latest scientific subject matter was interpreted in the farmers' language for animal husbandry, dairy, and poultry.

The graduate committee kept in close touch with the work that is going on at the graduate level. Directed teaching for student teachers was carried out at Greenville, Anderson, and in nearby schools.



Since more than one thousand teachers instruct more than thirty thousand pupils within commuting distance of Clemson, a fine opportunity exists here in the winter as well as in the summer for the training of teachers, and it is recommended that qualified men and women be admitted to classes and courses and be granted degrees.

National emergencies emphasize the need for conservation of all natural and human resources. In the summer, courses for teachers were given on the general subjects, with emphasis on the soil, the forests, water control, and the health and physical development and conservation of our people.

A great need of this school is more classroom and assembly space.

The enrollment in the **School of Engineering** during the past year was 1140 students. The increasing demand for technically trained men, it is believed, will cause the enrollment to increase again as it did just after the end of hostilities in 1946.

The school is now housed in two permanent buildings built in 1926 and 1927 when its enrollment was 527 students, and several temporary wooden structures given by the government in 1947. With more than double the enrollment in the past 23 years, it is absolutely essential that additional space be provided. The internal combustion engine equipment, now in a temporary building, is valued at nearly \$200,000, and this should be put in a permanent building safe from danger of fire.

The Electrical Engineering Department has added several excellent pieces of equipment during the year. A high voltage surge generator for simulating lightning surges and for testing electrical equipment insulation was built in the engineering shops by one of the graduate students in the course of his thesis work and will prove a valuable addition to the department.

The Chemical Engineering Department is continuing to grow and has an enrollment of 22 sophomores this year. With the increasing number of industries in South Carolina the graduates of this department will play an important part in our industrial life. It is a pleasure to report that a donation of \$5000 by Mr. J. L. Young of the class of 1920 was used to purchase two very desirable pieces of equipment which will bring nearer to completion the unit opera-

tions laboratory. Additional equipment for this laboratory is being constructed in the engineering shops.

The Ceramic Engineering Department is continuing its research in the development of ceramic minerals of South Carolina. Among the positive results of this work are the doubling of the capacity of two present plants and the construction of a new plant costing \$400,000. Another result is that South Carolina kaolin was advertised as such for the first time in a full page display of a July ceramics magazine. This department is also now teaching all the geology courses offered at the present time. Fifteen upperclassmen are registered in Ceramic Engineering, with the first scheduled for graduation in June 1951.

The tooling up of machine tool equipment in the Engineering Shops Department is continuing on a moderate scale because of limited funds. The machine shop has been rated as one of the best college shops in the country by a number of machine tool men who have visited the college. This shop constructed several thousand dollars worth of instruments and equipment for various laboratories of the college, including Physics, Textiles, Chemistry, and Agriculture, as well as Engineering.

The Industrial Engineering Department has started operation of the metallurgy laboratory. A large part of the equipment for this laboratory was designed and fabricated in the School of Engineering.

The Wood Processing Department offered several courses during the Summer School for grammar grade teachers and met an enthusiastic response.

The work of the graduate students in Engineering has been very satisfactory, and three students received their Master's degree in Engineering in 1950.

Five men of the School of Engineering were on leave during the past year taking graduate work at other institutions, and three of these returned this fall. Four men are on leave at the present time for graduate study.

The work of the Engineering Experiment Station is being continued. A bulletin on Bamboo Reinforcement in Portland Cement



Concrete was published in May 1950, giving very complete information on a large amount of original research.

The year 1949-50 has been the best in the history of the **School of Textiles**. The enrollment was the largest and for the first year since the war exceeded that of any other textile school. There were 830 and 690 students the first and second semesters respectively, an increase of 240 per cent on the average enrollment for the years 1935-42.

Graduates for the year numbered 226, and all wishing positions have readily found places in the industries. It now seems that the demand for Clemson graduates in textiles will exceed the supply again this year.

The teaching staff of the school has increased in number and quality, now having 32 members. During the year four men were on leave for graduate work towards their Master's degree, and three have received this degree. This year four are on leave, two for work on their Doctorate and two on their Master's.

Research work has been increased. Two men had research projects during the term and five during the summer months. Several practical developments are being offered to the industry. One outstanding development was a new method of spinning which has attracted wide attention and interest.

The new major course in knitting has met enthusiastic response. Fourteen men have already chosen this course, and the first graduates will be available to the knitting industry next June.

The urgent needs of the School of Textiles are more equipment and a higher salary level.

#### **Public Service Activities**

The public service activities have continued to function properly and definite progress has been made in solving the problems of the farmers and rural people of the state. The Extension Division and the Experiment Station inform the public as to the results of experiments conducted by the various agencies.

This year a concerted effort, with promising success, was undertaken in controlling the boll weevil. The danger was especially great because of the warm weather last winter. Efforts were also made to increase corn yields and improve pastures throughout the state.



Concrete was published in May 1950, giving very complete information on a large amount of original research.

The year 1949-50 has been the best in the history of the **School of Textiles**. The enrollment was the largest and for the first year since the war exceeded that of any other textile school. There were 830 and 690 students the first and second semesters respectively, an increase of 240 per cent on the average enrollment for the years 1935-42.

Graduates for the year numbered 226, and all wishing positions have readily found places in the industries. It now seems that the demand for Clemson graduates in textiles will exceed the supply again this year.

The teaching staff of the school has increased in number and quality, now having 32 members. During the year four men were on leave for graduate work towards their Master's degree, and three have received this degree. This year four are on leave, two for work on their Doctorate and two on their Master's.

Research work has been increased. Two men had research projects during the term and five during the summer months. Several practical developments are being offered to the industry. One outstanding development was a new method of spinning which has attracted wide attention and interest.

The new major course in knitting has met enthusiastic response. Fourteen men have already chosen this course, and the first graduates will be available to the knitting industry next June.

The urgent needs of the School of Textiles are more equipment and a higher salary level.

### **Public Service Activities**

The public service activities have continued to function properly and definite progress has been made in solving the problems of the farmers and rural people of the state. The Extension Division and the Experiment Station inform the public as to the results of experiments conducted by the various agencies.

This year a concerted effort, with promising success, was undertaken in controlling the boll weevil. The danger was especially great because of the warm weather last winter. Efforts were also made to increase corn yields and improve pastures throughout the state.

It seems that the public service agencies are making every effort to keep step with the changing agriculture and with the new and multitudinous problems with which we are faced today. I believe our staff members are cognizant of the world situation and how it may affect the farmer and agriculture. Indeed there are uncertainties everywhere, but I believe we are ready to work toward sound agricultural policies whether the years ahead are peaceful or warlike.

It is worthy that I mention the close ties between the Clemson staff, farmers of the state, and agricultural organizations—each working toward a strong and stable agricultural program. The spirit of competition and sometimes the outcropping of differences in thought must not be mistaken as friction.

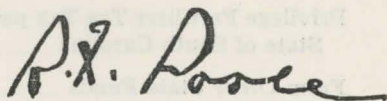
The work with young people in the agricultural programs bodes well the future of the state. At the present time fifty thousand 4-H Club members are learning the finer points of agriculture and agricultural management.

The faculties of the School of Engineering, Chemistry, and Textiles are contributing in various ways to education in agriculture by conducting various studies in woods, clays, etc., and we may hear more from these agencies in the future.

### **New Buildings**

The Agricultural Engineering and Chemistry buildings are nearing completion. They will add much-needed room to the college. When the buildings are completed, all of the money appropriated for permanent improvements at Clemson will have been spent advantageously. We were fortunate in obtaining materials for the construction of the Agricultural Engineering and Chemistry buildings.

If at all possible the Animal Science Building should be provided. The favorable improvement in livestock work makes it necessary that studies be conducted on cheese and other products. Adequate laboratories are not now available for such work.



President

## REPORT OF THE TREASURER

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

I have the honor of transmitting herewith the annual report of the financial affairs of the Clemson Agricultural College of South Carolina for the fiscal year July 1, 1949 to June 30, 1950 in accordance with an act of the General Assembly.

Respectfully submitted,

A. J. Brown,  
Secretary-Treasurer

---

### THE CLEMSON AGRICULTURAL COLLEGE OF SOUTH CAROLINA COLLEGIATE ACTIVITIES

Fiscal Year July 1, 1949 to June 30, 1950

#### INCOME

##### Legislative Appropriation:

(Revenue from Operation of Clemson College  
Transmitted to State of South Carolina)

Tuition & Matriculation Fees

Session 1949-50 ----- \$ 538,130.87

Privilege Fertilizer Tag Tax paid to

State of South Carolina ----- 225,462.89

From Other State Funds -----

587,300.24

Total Legislative Appropriation ----- \$1,350,894.00 \$1,350,894.00



Federal Funds .....	45,841.20	
Endowment Funds .....	9,266.36	
Miscellaneous—Rents, Sales & Service .....	103,972.03	
Student Fees:		
Laboratory Fees .....	\$152,723.09	
Class Maintenance Fees .....	53,717.28	
Summer School 1949 .....	66,676.19	
Summer School 1950 .....	39,622.75	\$ 312,739.31
Sales and Service Collegiate Departments .....	491,769.62	
Auxiliary Enterprises .....	1,021,307.02	
Total Income Collegiate Activities .....	\$3,335,789.54	

## EXPENDITURES

July 1, 1949 — June 30, 1950

A-1 Salaries .....	\$1,311,008.83
A-2 Wages .....	424,428.96
B-2 Travel .....	25,440.62
B-3 Telephone & Telegraph .....	7,894.70
B-4 Repairs .....	156,802.18
B-6 Heat, Light, Water, Coal & Power .....	154,398.02
B Contractual Services .....	12,229.36
C Supplies .....	826,764.39
D Other Charges .....	252,284.04
G-7 Equipment .....	82,113.77
H-3 Improvements .....	46,325.76
H-4 Investment .....	6,000.00
*Total Expenditures .....	3,305,690.63

\* Includes \$55,603.60 for Fertilizer Inspection and Analysis and \$1,012,039.46 for Student Subsistence, Room, Laundry, etc.

## STUDENT ACTIVITY FUNDS

## Receipts:

Athletic Association .....	\$247,314.08	
Taps .....	23,742.26	
Tiger .....	12,716.11	
Y.M.C.A. ....	63,933.20	
Concert Series .....	18,778.83	
Clemson Alumni News .....	3,655.05	
Student Parking Fines .....	93.35	\$370,232.88

## SUPPLEMENTARY REPORTS

**Expenditures:**

A-1	Salaries .....	66,219.41	
A-2	Professional Services & Wages .....	41,949.82	
B-2	Travel .....	39,776.74	
B-3	Telephone & Telegraph .....	1,592.77	
B-4	Repairs .....	24,360.01	
B	Other Services .....	48,999.52	
C	Supplies .....	48,628.40	
D	Fixed Charges .....	87,182.59	
G	Equipment .....	5,081.91	
	Investments .....	35,920.00	\$399,711.17

**SPECIAL STATE APPROPRIATIONS****Appropriations:**

Clemson College—For the construction or enlargement of hospital and the purchase of equipment therefor .....	\$ 300,000.00	
Clemson College — For the construction of buildings or the renovation or repair of existing buildings, and equipment therefor ..	\$ 636,970.49	
Clemson College—For the construction of an Agricultural Engineering Laboratory and the equipment therefor .....	\$ 247,300.00	\$1,184,270.49

**Expenditures:**

H-2 Buildings .....	\$ 320,668.43	\$ 320,668.43
---------------------	---------------	---------------

**STUDENT BANK ACCOUNT**

Balance on Hand July 1, 1949 .....	\$ 109,099.55	
Deposits Current Year .....	\$ 495,730.92	\$ 604,830.47
Checks Paid Current Year .....	\$ 569,023.66	
Balance June 30, 1950 .....	35,806.81	\$ 604,830.47

**SMITH-LEVER AGRICULTURAL EXTENSION WORK****Receipts:**

Brought Forward .....	\$ 12,860.19
Appropriations: Federal .....	861,369.20
State .....	583,093.00
	<u>\$1,457,322.39</u>

**Expenditures:**

A-1	Salaries	\$1,151,117.13
A-2	Wages	9,619.45
B-2	Travel	185,290.40
B-3	Telephone & Telegraph	15,759.18
B-4	Repairs	2,762.79
B	Other Services	29,812.47
C	Supplies	39,901.99
G	Equipment	16,721.57

---

 \$1,450,984.98

Carried Forward	6,337.41	\$1,457,322.39
-----------------	----------	----------------

---

**MISCELLANEOUS STATE APPROPRIATIONS  
EXTENSION SERVICE**

**Receipts:**

State Soil Conservation Committee	\$	5,000.00	
Camp Long Appropriation		2,500.00	
Camp Cooper Appropriation		2,500.00	
State Marketing Commission		6,857.84	\$ 16,857.84

---

**Expenditures:**

A-1	Salaries	\$	5,279.83	
A-2	Wages		2,524.37	
B-2	Travel		5,420.37	
B-3	Telephone & Telegraph		29.91	
B-4	Repairs		1,747.90	
C-6	Heat, Light, Water & Power		108.65	
B	Other Services		180.97	
C	Supplies		955.72	
D	Fixed Charges		295.70	
G	Equipment		314.42	\$ 16,857.84

---

**SOUTH CAROLINA EXPERIMENT STATION  
Federal Funds**

**Receipts:**

Adams Fund	\$	15,000.00	
Hatch Fund		15,000.00	
Purnell Fund		60,000.00	
Bankhead-Jones Fund		69,224.19	
Research & Marketing (Regional) Fund		34,445.00	
Research & Marketing (Non-Regional) Fund		88,855.84	\$ 282,525.03

---



**Expenditures:**

A-1	Salaries .....	\$ 207,403.68	
B-2	Travel .....	9,906.86	
B-3	Telephone & Telegraph .....	1,004.62	
B-4	Repairs .....	9,249.74	
B-6	Heat, Light, Water & Power .....	947.00	
B	Other Services .....	4,522.72	
C	Supplies .....	25,519.86	
D	Fixed Charges .....	201.59	
G	Equipment .....	15,764.85	
H-2	Buildings .....	770.74	\$ 275,291.66

**SOUTH CAROLINA EXPERIMENT STATION**  
**State Funds**

**Receipts:**

Agricultural Research .....	\$ 142,189.00	
Crop Pests & Diseases .....	34,760.00	
Coast Station .....	10,000.00	
Edisto Station .....	83,845.00	
Pee Dee Station .....	49,407.00	
Sandhill Station .....	9,950.00	
Truck Station .....	58,985.00	
Peach Research .....	15,000.00	
Research on Lice & Pests on Tobacco .....	20,000.00	\$ 424,136.00

**Expenditures:**

A-1	Salaries .....	\$ 204,276.88	
A-2	Wages .....	83,444.41	
B-2	Travel .....	8,553.01	
B-3	Telephone & Telegraph .....	1,613.91	
B-4	Repairs .....	11,338.19	
B-6	Heat, Light, Water & Power .....	3,039.35	
B	Other Services .....	3,337.20	
C	Supplies .....	47,890.95	
D	Fixed Charges .....	6,926.64	
G	Equipment .....	21,609.96	
H-3	Improvements .....	28,525.50	
H-2	Buildings .....	3,580.00	\$ 424,136.00

**SOUTH CAROLINA EXPERIMENT STATION**  
**Farm Products Fund**

**Receipts:**

Balance Brought Forward .....	\$ 61,210.18	
Farm Products .....	362,179.90	
State Marketing—Reimbursement .....	19,003.19	
Market Information .....	20,000.00	
S. C. Foundation Seed Work .....	50,000.00	\$ 512,393.27

**Expenditures:**

A-1 Salaries .....	\$ 35,664.12	
A-2 Wages .....	115,024.89	
B-2 Travel .....	5,227.99	
B-3 Telephone & Telegraph .....	1,473.24	
B-4 Repairs .....	30,512.09	
B-6 Heat, Light, Water & Power .....	2,744.74	
B Other Services .....	10,688.57	
C Supplies .....	178,324.23	
D Fixed Charges .....	9,162.25	
G Equipment .....	28,546.46	
H-3 Improvements .....	10,011.73	
H-2 Buildings .....	12,916.43	

440,296.74

Balance Carried Forward ..... 72,096.53 \$ 512,393.27

**LIVESTOCK SANITARY WORK**

**Receipts:**

Balance 6/30/47 Brought Forward .....	\$ 8,808.53	
State Appropriation .....	132,943.00	
Sales & Service .....	36,309.05	\$ 178,060.58

**Expenditures:**

A-1 Salaries .....	\$ 64,867.30	
A-2 Wages & Professional Services .....	21,028.00	
B-2 Travel .....	14,251.75	
B-3 Telephone & Telegraph .....	1,033.19	
B-4 Repairs .....	309.52	
C Supplies .....	52,048.73	
D Fixed Charges .....	12,817.00	
G. Equipment .....	3,804.91	

170,160.40

Balance 6/30/47 Carried Forward ..... 7,900.18 \$ 178,060.58

**REPORT OF 1950 BOARD OF VISITORS**

To the Board of Trustees  
The Clemson Agricultural College  
Clemson, South Carolina

Gentlemen:

The Board of Visitors, first of all, wish to express their sincere appreciation for the honor of being invited to inspect the plant and the facilities of Clemson College, and, second, to express equally sincere appreciation for the many courtesies extended to them on the occasion of their visit. The tour of inspection was well planned and well executed, and in every department of the college the Board was extended the full courtesies of the administration, the faculty and the student body.

We submit the following observations and recommendations:

1. It is the unanimous opinion of the Board that the outstanding additional need for physical expansion at the present time, after current construction is completed, is improved facilities to house the School of Arts and Sciences. In a technical agricultural and engineering institution, such as Clemson College is, there is a natural tendency to submerge, or, perhaps, without proper understanding, to fail to emphasize the fundamental importance of the School of Arts and Sciences. This school is the torch-bearer of all the components of any broad college education. It is the interpreter of all the true values that lie in broad culture.

Our observation impresses us with the glaring lack of space and unified teaching facilities of Clemson's School of Arts and Sciences. We recommend that early attention be given to meeting this need.

2. We recommend that every effort be made to secure adequate funds to maintain a stable and strong faculty.



3. We recognize the importance of a strong and vigorous research program to solve the many problems arising from the important diversification of agriculture in this state, and we recommend that strong efforts be made to secure the necessary funds to finance the program and maintain well trained personnel to that end.

4. We recognize the great need for additional classroom and laboratory space to meet present needs at Clemson and recommend that steps be taken to obtain sufficient space in order that teachers may be able to render efficient and effective counseling and teaching.

5. We commend the Board of Trustees and the General Assembly in making available funds for immediate building, thereby improving faculty living quarters, classrooms, and laboratories. We endorse the animal science building now under consideration by the General Assembly. We know that the great interest in livestock among the farmers of this state would profit by expanding research and education in animal matters.

6. The large Clemson plant seems to be in a good state of preservation, but the old buildings should be given constant attention to keep them livable and serviceable. Water, steam, and sewer lines in many cases have become too small to properly supply the need and in some cases have corroded after long use. We recommend that adequate financing be sought to put into good shape and maintain these units. In plans for further expansion of the Clemson plant, we recommend that consideration be given to unit heating.

7. We commend the college for the excellent beginning in studying and developing the important clays of the state and recommend that steps be taken to enlarge the knowledge of ceramics.

8. We commend the teaching of forestry, especially for those who are to become vocational agricultural teachers and county agents. The forest products are becoming increasingly more valuable and are worthy of much study and education. We recommend that the college give much encouragement to forestry education,

and that when sufficient funds are available give consideration to the establishment of a full school of forestry.

9. We commend the college for bringing to the campus many groups representing many functions to work out closer relations and perfecting programs of usefulness to the state, and, admonish it to further effort in developing understanding and a strong common approach to the problems of agriculture and other industries.

10. We commend the J. E. Sirrine Textile Foundation for the forthright manner in which it contributes to the development of the Clemson School of Textiles. We recognize the value of the textile industry to the welfare of many people in South Carolina, and believe every effort should be taken to obtain the necessary equipment for the best textile education and to conduct research toward keeping the cotton fiber worthy.

11. We commend the college for the program aimed at controlling insects and diseases. The boll weevil, screw worms, and others that attack plants, animals, and fowls, seriously affect the economy of the state. We recommend greater efforts toward controlling these pests through research, demonstration, and education.

12. In conducting the financial affairs of the college, we believe that the trustees should have full and free powers of controlling all monies collected for any and all fees from the students. We believe that the state supply bill should be so presented that it shows the truly-tax-obtained-monies allocated to the college.

13. In view of the increasing emphasis being placed upon the science of city and county management, we recommend that consideration be given to including within the school curriculum courses to train county and city managers.

14. We suggest that the Board of Trustees study the possibility of the sale of self-liquidating bonds for construction of additional barracks.

15. We wish to commend very highly the outstanding work being done by Dr. R. F. Poole as president of the institution. Our contacts with the faculty, members of the administration, the student body, and our observation of the fine spirit of morale existing within the faculty and the student body bear testimony of the exceptionally high order of administration Clemson College is experiencing under the leadership of Dr. Poole and his associates.

The Board recommends to the Board of Trustees the appointment of D. V. Richardson of Georgetown, South Carolina, as a hold-over member for 1951.

Respectfully submitted,

S. L. Latimer, Jr., Chairman

James A. Rogers, Secretary

L. J. Williams  
Henry W. Fair  
C. Bruce Barksdale  
L. P. Thomas

Senator Marvin E. Abrams  
Thomas Ancrum  
Henry C. Moore  
D. V. Richardson



**REPORT OF DIRECTOR OF DEPARTMENT OF  
FERTILIZER INSPECTION AND ANALYSIS**

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

I have the honor to transmit herewith the report of the Department of Fertilizer Inspection and Analysis for the fiscal year ending June 30, 1950.

Respectfully submitted,

H. P. Cooper, Director

A summary of the activities and accomplishments of the Department of Fertilizer Inspection and Analysis for the fiscal year 1949-1950 follows:

Tons of fertilizer for which tax tags were furnished	888,769*
Number official samples procured	5,421
Number bags represented by each sample	117
Number bags underweight in dealers' warehouses	7,110
Average shortage per bag, lbs.	2.99
Number bags with irregularities other than weight in dealers' warehouses	2,485
Number bags underweight on farms	4,153
Pounds fertilizer refunded to farmers on account of short weight	44,051
Number toxicological examinations	9
Number samples of water analyzed	48

Excellent cooperation exists between members of the fertilizer industry, agricultural workers, and fertilizer control officials. In order to review the problems of the various groups, strive for better results, and still closer coordination, an annual fertilizer conference is sponsored by the college, to which all fertilizer manufacturers, dealers, and salesmen are invited.

A two-day fertilizer inspectors' school was conducted at the Pee Dee Experiment Station at Florence on January 19 and 20.

Each year the services of this department are in greater demand. Farmers are not only requesting that official samples be procured, but also that the weights of their fertilizer be checked.

Last spring eight fertilizer inspectors were deputized to serve as inspectors of insecticides and fungicides for the South Carolina State Crop Pest Commission. This procedure will enable the College at reasonable cost to assure the farmers of the state that the materials sold for the control of insects and plant diseases conform to approved standards.

---

\*Eleven per cent less than for 1948-1949.

## REPORT OF DIRECTOR OF LIVESTOCK SANITARY DEPARTMENT

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

I have the honor to transmit herewith the annual report of the Clemson College Livestock Sanitary Department for the fiscal year ending June 30, 1950.

Respectfully submitted,

R. A. Mays, Director

---

### Hog Cholera

During the year 132,044 hogs were treated with anti-hog Cholera serum and virus on 7,260 farms.

During the year a variant type of hog Cholera virus was found against which the simultaneous treatment, in a small percent of the herds, failed to immunize successfully against the disease. The veterinarians employed by the serum and virus producers and also those from the Bureau of Animal Industry have rendered assistance in connection with this work.

### Brucellosis

We have continued to make progress in reducing the incidence of Brucellosis in infected herds. In testing 65,848 blood samples from cattle for Brucellosis, we found 1,083 showing a positive reaction to the test, which is only 1.6 percent of the total as com-



pared with the Nation-wide average percentage of infection of approximately 5 percent. So we feel that the cattle owners in this state have demonstrated excellent cooperation in combating this disease. At the present time we have 242 Brucellosis Accredited Herds in the state and there are several hundred others in the process of accreditation.

The control of Brucellosis in hogs is a greater problem than in cattle. In herds showing very much infection it is very difficult to eliminate the disease from the farm, and the general idea seems to be that it is advisable to sell all hogs on the place and purchase replacements from known Brucellosis-free herds.

### **Tuberculosis**

Our native cattle are comparatively free of Tuberculosis infection. Tests on 34,493 animals showed 38 infected and six classified as "suspects". A large percentage of the infected cattle had been imported into the state during the past few years. Since these cattle were received on health certificates approved by the livestock sanitary authorities of the state of origin, apparently some of the imported animals had been exposed to the infection shortly prior to the test for shipment. One hundred and thirty-four cattle herd owners have Tuberculosis Accredited Herds, an increase over previous years.

### **Health Certificates**

A summary of outgoing and incoming records of animals shipped into and from this state shows the following:

Incoming animals: 3716 cattle; 493 hogs; 480 dogs; 8 chickens; 630 horses and mules; 1 monkey; 1 goat; 2 cats; 7 sheep.

Outgoing animals: 1,745 cattle; 5,073 hogs; 1,147 dogs; 1,093 birds and chickens; 82 horses and mules; 5 goats; 1 cat; 48,000 turkey eggs.

### **Auction and Public Livestock Markets and Promotional Sales**

We have received excellent cooperation in working with the livestock auction markets, public livestock markets, and breed-

ers' promotional sales in controlling animal diseases and offering for sale the best quality of animals possible under existing conditions. The majority of our better organized and equipped markets are very appreciative of the service rendered through the department.

### **Community, County, and State Fairs**

We are continuing to receive excellent cooperation from all owners of livestock who wish to exhibit animals at fairs. They are cooperating in testing their animals prior to exhibiting them at the fairs, and many owners hold them in isolation for a thirty-day period after returning them to their farms.

### **Rabies**

During the year we have had several sporadic outbreaks of Rabies in a few isolated sections of the state. With the enactment of a law requiring the annual injection of all dogs with Rabies vaccine, the incidence of this disease should show a decrease in proportion to the number of animals treated. Stray and unconfined dogs appear to be the principal disseminators of Rabies; infected foxes are responsible for spreading the disease to many farm animals.

### **Educational**

Livestock and poultry owners are always interested in learning more about the prevention of diseases among their animals. Educational work of this kind is carried on by contact with individuals, and groups and by mailing information to those who make requests of the department. In addition, we have distributed several hundred copies of the booklet "What is Known About Brucellosis"; and copies of acts recently passed by the legislature have been placed in the hands of interested individuals and groups.

### **Miscellaneous**

The department continues to make investigations wherever owners suspect the presence of contagious and infectious diseases. In those cases where an emergency exists, deputy state veterinarians

are requested to make the investigation. With the addition of several young veterinarians, who have located in the state to practice, further increase of such services is possible through the practicing veterinarians.

Little trouble has been noted with such diseases as Hemorrhagic Septicemia, Black-leg, Keratitis, Swine Erysipelas and Encephalomyelitis. Where these diseases are found, the livestock owners have received assistance in immunizing the exposed and other animals in the surrounding area in order to prevent the spread of the disease.

Veterinarians employed by the Bureau of Animal Industry have continued to render valuable assistance in the animal disease prevention, control, and eradication program.

### Laboratory

The poultry and livestock industries are using the services of the department's laboratory more each year making diagnoses of trouble with sick animals and poultry. When livestock and poultry owners visit the laboratory they are very eager to obtain the latest available information that will assist them in practicing better sanitary precautions with animals and poultry. The owner who comes into the laboratory and talks over his problems, usually feels that he has received better information than could possibly have been given him in a letter.

A summary of the various types of specimens examined in the laboratory during the past year shows:

Cattle (Bang's disease) .....	65,848
Turkeys (Pullorum disease) .....	51,661
Poultry .....	1,250
Swine .....	881
Sheep and Goats .....	66
Dogs .....	4
Horses and Mules .....	56
Miscellaneous .....	110
Grand Total .....	119,876



**THE REPORT OF THE STATE CROP PEST COMMISSION**

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

I have the honor to transmit herewith the Annual Report of the Crop Pest Commission for the fiscal year ending June 30, 1950.

Respectfully submitted,

H. P. Cooper, Director

**Nursery Inspections**

The law requires at least one annual inspection of nurseries and more if necessary. Lack of sufficient funds and personnel has limited the inspections to one per year. The number of nurseries has increased considerably the inspection work necessary for certification which enables South Carolina nurseries to compete with those of other states in the marketing of their products. In general, the nurseries were in good condition, and insect pests and plant diseases were not common.

There was considerable increase in inspections made for home owners who sell plants through the mail.

**Greenhouse Inspections**

As required by the Commission, plants in greenhouses throughout the state were inspected one or more times during the year. The plants in 53 greenhouses located in 26 cities were examined and certified.

Light infestations of certain insects and diseases were noted; but none was sufficiently serious to require special control measures.

### **Parcel Inspections**

This office receives numbers of packages of plant material shipped by persons who wish to send them to friends or relatives in this or other states. These packages are inspected, and, if found free of insect pests and plant diseases, they are forwarded to their destination. This office issued 10,000 label permits during the year for sale of cuttings of shrubs and flowering plants.

### **Registration of Out-of-State Nurseries**

In order to prevent the introduction into South Carolina of injurious insect pests and plant diseases from other states, all out-of-state nurseries are required to file with the Crop Pest Commission certificates showing that the nurseries have been officially inspected and found free of injurious pests. During the year 416 nurseries in 30 states registered for the shipment of nursery stock into South Carolina.

### **Sweet Potato Inspections**

Many years ago the Crop Pest Commission, realizing the great loss caused by diseases of sweet potatoes, established regulations requiring inspection and certification of this crop for growers wishing to sell seed sweet potatoes and plants. This service has done much to improve the quality of this important crop.

Three inspections—field, storage, and plantbed—were given the sweet potatoes of 116 growers during the 1949-50 season. None of the major diseases, in field or in storage, occurred in sufficient amounts to justify refusal of certification. Diseases common to sweet potatoes are found each year, and, if their increase were not limited through the inspection and certification service, it would cause much greater loss.

### **Internal Cork of Sweet Potatoes**

This virus disease now occurs throughout South Carolina and though not subject to quarantine in this state, is of sufficient importance to warrant research to prevent its spread and find means for its control. Some southern states, in which the disease is not known to occur, have established quarantines against South Carolina.

### Seed Irish Potatoes

Seed Irish potatoes entering Charleston County were again inspected during January. Approximately 200 carloads were examined.

A small amount of scab, rhizoctonia, and soft rot was found; but the potatoes were on the whole unusually free of disease. No bacterial ring rot or other serious disease was found.

### Bees

Bees belonging to 74 individuals or apiaries and comprising 8,721 colonies were inspected. Of these, 337 were found to be diseased. The diseases found and the number of colonies affected by each were as follows: American foulbrood, 54; European foulbrood, 252; nosema, 30; paralysis, 1.

Good beekeeping methods play an important role in disease control, and the inspector has continued to cooperate with beekeepers in furnishing advice and help.

### White-fringed Beetle

In cooperation with the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, work has been continued in an effort to eradicate this pest from South Carolina. This insect occurs in restricted areas in Richland, Lexington, and Fairfield counties. In spite of very intensive inspections in the localities infested, no extensions of the infested areas were found. Efforts are being made to apply effective soil treatments to all infested areas. These treatments have apparently been very effective since no live adult beetles have been found this year at any of the points known to have been infested prior to 1949.

### Sweet Potato Weevil

As previously reported, this insect was first found during the fall of 1946 infesting sweet potatoes in South Carolina in the vicinity of Charleston. At the same time heavy infestations were found in *Ipomoea littoralis*, a seaside morning glory, on the beaches in that vicinity. Subsequent surveys in Charleston County and elsewhere in the state have failed to reveal other presence of the wee-



vil. With the establishment and maintenance of non-sweet potato planting zones beginning in 1948, suppressive measures consisting of a combination spray of 2,4-D (ester form) and DDT to eliminate the host, *I. littoralis*, and reduce the weevil population were undertaken and were substantially effective. Subsequently, a marsh morning glory, *Ipomoea sagittata*, was found to be infested, and in many instances was nearer the sweet potato producing areas than *I. littoralis*. Efforts to control this morning glory by the same spray used against *I. littoralis* were less effective. More encouraging results were obtained when the amine salt of 2,4-D was used instead of the ester form.

The problem of volunteer sweet potato destruction has been unusually difficult during this period. The winter of 1949-50 at Charleston was one of the mildest recorded by the U. S. Weather Bureau. Weevils were active practically throughout the winter.

Trapping adult weevils during the winter and spring months has proved a reliable method of determining infested localities, winter survival, and activity of the insect.

### Phony Peach

Phony disease was again found in all areas having commercial peach orchards in which the disease was known to be established. In addition, it was found for the first time in Cherokee County.

The program for 1949 provided for (1) the inspection of peach-growing nurseries in the regulated area, (2) the inspection of commercial orchards, home orchards, and wild trees within a reasonable infective distance of counties having known infestations, and (3) the extension of inspections in the Spartanburg area to include Cherokee County.

An inspection was made of one commercial orchard of 7,500 trees in Orangeburg County, and 242 phony trees were found. Since 1938, Phony Peach apparently had been eliminated from this county, and the area had been released from regulations.

Altogether 3,875,908 trees on 3,688 properties were inspected in 8 counties during the year, and 1,015 phony-infected trees were found. The diseased trees were confined to 204 properties, and all were removed and destroyed.

### **Japanese Beetle**

The Japanese beetle is a potentially serious pest of many kinds of plants grown in South Carolina. Since it was first discovered in the United States in 1917, the Crop Pest Commission has enforced regulatory measures to prevent its establishment in the state, and several incipient infestations have apparently been eradicated.

During the past season traps were set in various cities in South Carolina. As a result, 58 beetles were collected in Greenville and two in Florence.

### **Golden Nematode**

The golden nematode, a pest of Irish potatoes, was first discovered in the United States in Nassau County, Long Island, in 1941. It has been known in Germany since 1881.

Each year the Bureau of Entomology and Plant Quarantine, U. S. D. A., in cooperation with the various states, conducts surveys to determine whether this nematode occurs in sections of the country other than New York. In surveys made in Beaufort, Charleston, Colleton, Hampton, and Horry counties during the season, no golden nematodes were found.

### **Testing of Insecticides**

The testing of dusts or spray materials sold to farmers for the protection of their crops against attack has long been an important function of the Crop Pest Commission. In 1949, the evaluation of organic insecticides through chemical analysis was begun, and the experimental testing of insecticides was undertaken in 1950. Over 400 samples of such insecticides have been collected from over the state, probably providing samples of materials for cotton dusting from every manufacturer selling insecticides in South Carolina. Samples were shipped to Clemson for chemical and bioassay tests.

**Chemical Tests.**—Each sample is examined by chemical methods to determine whether it contains the ingredients claimed. The manufacturer and the dealer, or purchaser are notified regarding deficiencies found. Industry has cooperated whole-heartedly in the program, and the quality of insecticides sold in the State has been uniformly good.



**Tests against Boll Weevils.**—The critical test of an insecticide is whether it will kill the insects it is designed to kill. All of the insecticides recommended for use on cotton are being tested against adult boll weevils.

Early tests were made with weevils which had left hibernation quarters and entered cotton fields. Thousands of such weevils were picked out of the cotton fields and sent to Clemson. Because these weevils were almost a year old (having lived through the winter), laboratory tests with them were not too satisfactory.

As soon as punctured squares could be obtained, these were collected as a source of adult weevils. These adults have been uniform and have given reliable results in the laboratory tests.

To assure uniformity in the testing program, plantings of cotton are made twice a week, and the young cotton plants are grown in pots until they have two to four leaves. Also, a precision vacuum duster has been built with which each plant is dusted with a weighed amount of dust in a standard volume of air. By this procedure, it is possible to duplicate repeatedly the results from tests.

After dusting the cotton plants, each plant is enclosed in a five-inch spherical cage containing 10 adult boll weevils. After three days the cage is examined and the live and dead weevils are counted.

**Soil Toxicity Studies.**—To determine the possible effects upon plant growth of insecticidal residues in the soil, plots containing soil from the Coastal Plains, the Sandhills, and the Piedmont areas are to be established. To the soils of these plots will be added organic insecticides used in South Carolina. The amounts will vary from that applied in one year to those that might accumulate in fields where the cotton is dusted during a period of five to ten years. Plants sensitive to the chemicals are to be grown in these plots as indicators. Because of the amounts of organic chemicals applied each year to South Carolina crop land, the importance of this work cannot be overlooked.



**REPORT OF DIRECTOR OF EXPERIMENT STATION**

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

Below is a brief report of some of the work carried on by the South Carolina Experiment Station. Only brief statements regarding the various projects can be given here. More detailed reports will be found in the Annual Report of the Station. Copies of the latter are available upon request.

Respectfully submitted,

H. P. Cooper, Director

During the past year, increasing demands have come from the farmers of the state for research information on problems which have arisen recently or which have become more acute within the last few months.

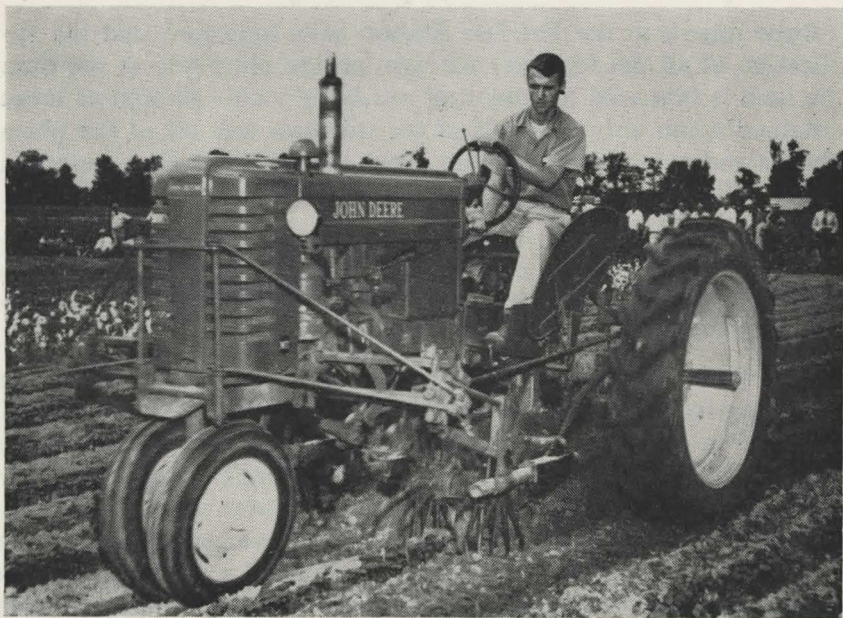
One such problem is the ascochyta disease of cotton, which became rather serious the past spring. Efforts are being made to determine the cultural practices and other measures which will keep damage from this disease at a minimum. The disease has been found to be most serious when cotton follows in successive years. Early destruction of the old stalks is important in preventing damage from the disease.

Special notice has been taken of thrips and other insects which attack cotton in the early seedling stage. This problem seems to have assumed greater importance as the area planted to small grains has increased and is apparently related to the prevalence of the ascochyta disease. Control of thrips and their possible relationship to ascochyta are being investigated at the present time.

Another problem which has caused much concern is the possible harmful effect of using the new insecticides recommended for the control of the boll weevil and other pests. Some of these materials accumulate in the soil and may later affect the growth of plants and possibly the health of animals consuming the plants. In this connection there is also the question of whether the insecticides sold to farmers conform to the standards claimed. Much effort is being devoted by the Station to these questions.

An increasing amount of work is being done at the Edisto Station on the diseases of cantaloupes and watermelons in an attempt to reduce the damage suffered each year from such diseases as downy mildew, anthracnose, and wilt.

The internal cork disease of sweet potatoes, first observed in this state a few years ago, is apparently increasing in importance. An attempt is being made to breed strains of sweet potatoes resistant to the disease and to determine its transmissibility and other associated factors.



Power Rotary Weeder



An efficient rotary weeder has been designed by agricultural engineers in the Station, which is a considerable improvement over other tools for cultivating young cotton. It is being perfected and will be patented.

Because of increasing damage by nematodes, the Edisto Station studied the effect of soil fumigation upon this pest during the past season. The treatment cost \$15 per acre and resulted in a crop worth nearly \$50 per acre more than when no treatment was used.

Cantaloupe mosaic is becoming of considerable consequence in areas where this crop is grown. The disease also affects watermelons, cucumbers, and squash and is apparently due to a specialized virus. Its biological and physical characteristics are being studied.

Studies of controlling weeds in asparagus plantings by means of chemicals are being made at the Edisto Station as part of an effort to revive the growing of this crop, which was formerly of considerable magnitude but which has declined in recent years almost to the zero point. Results so far are promising.

Experiments at the Pee Dee Station have indicated that the application of all the fertilizer for corn on the plow-sole at the time the land is prepared for planting results in yields as high as those obtained when only one half of the nitrogen and all of the phosphorus and potash were applied when the corn was knee-high and the remainder of the nitrogen at the last cultivation.

The Pee Dee Station is testing a number of varieties of grain sorghum, a crop which continues to increase in popularity with farmers. Yields, suitability for combining, and other characteristics of the different varieties are being compared.

The winter survival of boll weevils and the number of weevils emerging from hibernation have been the subject of special study at the Pee Dee Station. Last spring the percentage of weevils which had survived the winter in woods trash was about four times the average for the 13 preceding years, and the number emerging into fields from hibernation was five times the average for the 13-year period. These figures provided a significant index of the probable prevalence of the insect during the summer which followed. The indications were confirmed as the season progressed.



Pre-emergence applications of herbicides in corn plantings have shown that this is a promising method of controlling weeds in corn fields. The use of herbicides in cotton fields is also being investigated, but the margin of safety in the case of cotton plants is less than with corn plants, and this limits the possibilities of chemical weed control in cotton.

Work at the Truck Station continues to show the necessity of giving attention to soil acidity and the use of minor elements, since some of them, if improperly used, may be toxic or may upset the nutritional balance of plants.

A new strain of mosaic-resistant romaine lettuce developed at the Truck Station gives promise of restoring the production of this type of lettuce, which was discontinued because of the mosaic disease.

### **Increasing Interest in Seed Certification**

During the three years since the establishment of the seed certification service in South Carolina, interest in and production of certified seed has greatly increased. The Seed Short Course held at Clemson during Farmers' Week and sponsored by the Crop Improvement Association has been most helpful to farmers and seedsmen.

### **Plant Residues for Soil and Water Conservation**

For several years the Station in co-operation with the Soil Conservation Service, U. S. D. A., has investigated the value of mulches for controlling run-off and erosion on cultivated land.

Storms of greatest intensity usually occur during the summer months when cultivated areas are most susceptible to erosion. The effectiveness of a mulch in protecting soil at such times was dramatically shown when a rain of 1.46 inches occurred July 16, 1950. On corn plots mulched with vetch and rye residue, run-off and soil loss were, respectively, 1.36 percent and 107 pounds per acre. In contrast with these negligible losses, run-off and soil loss of 31.44 percent and 507 pounds per acre, respectively, occurred on plots where the cover crop had been turned under.

Plowed plots where no cover crop had been turned under suffered a run-off of 45.59 percent and a loss of soil equivalent to 2231 pounds per acre.

Equipment is being developed to make this method of crop production practical.

### **Soil-Testing Service**

A soil-testing service has been provided for the farmers of the state by the Station for over 20 years. Recognition of the value of this service is evidenced by the daily arrival of samples to be tested from all sections of the State. Requests for the service are increasing and during the year, July 1, 1949, to June 30, 1950, tests were made for farmers on 12,385 samples.

When the samples have been tested, recommendations are sent to the farmers as to needed lime and fertilizer treatments.

### **"What Goes On in the Dark?"**

For a long time both producers and consumers have been concerned about the wide spread between prices at the farm and in the retail store. A recent study sheds considerable light on the question with respect to tomatoes.

For example: Of 100 pounds of tomatoes ready for harvest, 14.8 pounds were discarded at picking, 17.8 pounds were culled at the packing shed, 9.2 pounds were discarded during repack operations, and 1.5 pounds were lost on the retail shelves. Only 56.7 of the original 100 pounds on the vine ever reached the consumer's table.

The price paid by the consumer for tomatoes must reflect, on the average, not only the cost of growing, picking, hauling, packing, and merchandizing the quantity of tomatoes finally reaching the retail stores, but also numerous costs in connection with the handling of tomatoes lost along the way. Had there been no marketing charges at all, prices paid by consumers would have had to be approximately twice those received by the farmers!

### **Development of Equipment for Use in Sweet Potato Production**

For several years the Station has been working in co-operation with the U. S. D. A. on equipment for reducing the large labor requirement in planting, cultivating, and harvesting potatoes. As a result several new implements have been developed. The first of these is a simple transplanter which reduces the labor of planting by about 60 percent. New and improved cultivating equipment has practically eliminated hand hoeing. A new digger, still in the experimental stage, shows real promise. In harvesting about 70 acres of sweet potatoes last year, this digger exposed 96.33 percent of the potatoes with negligible bruising and reduced considerably the labor required in picking them up. Tests of the digger should be completed during the 1950 harvesting season., and then recommendations will be made for its general use.

### **Pastures for Cattle**

**Winter Pasture for Dairy Cows.**— A three-year study of winter pasture consisting of rye grass and crimson clover revealed the value of such pastures for milking cows. Cows grazing the pasture and receiving only about 45 percent as much barn feeding as the control animals, which were entirely barn-fed, produced nearly 22 percent more milk than the latter.

The pasturage obtained by the cows each year was equivalent to 3½ tons of lespedeza hay per acre having a gross value of about \$122. Since the cost of providing the pasturage was about \$57 per acre per year, its net value from a feed-saving standpoint was about \$65 per acre annually. To this can be added the value of the extra milk produced by the cows grazing the pasture.

The carotene content of the milk ranged from 109 to 716 parts per million of dry matter and averaged 413 parts per million for the three years. The milk averaged 97 percent more vitamin A potency than that produced by the barn-fed controls,

**All-Year Pastures for Beef Cattle.**— While there is still some question as to the best combination of plants for summer pasture, experiments by the Station have shown that a mixture of Bermuda, dallis grass, lespedeza, and white Dutch clover gives very

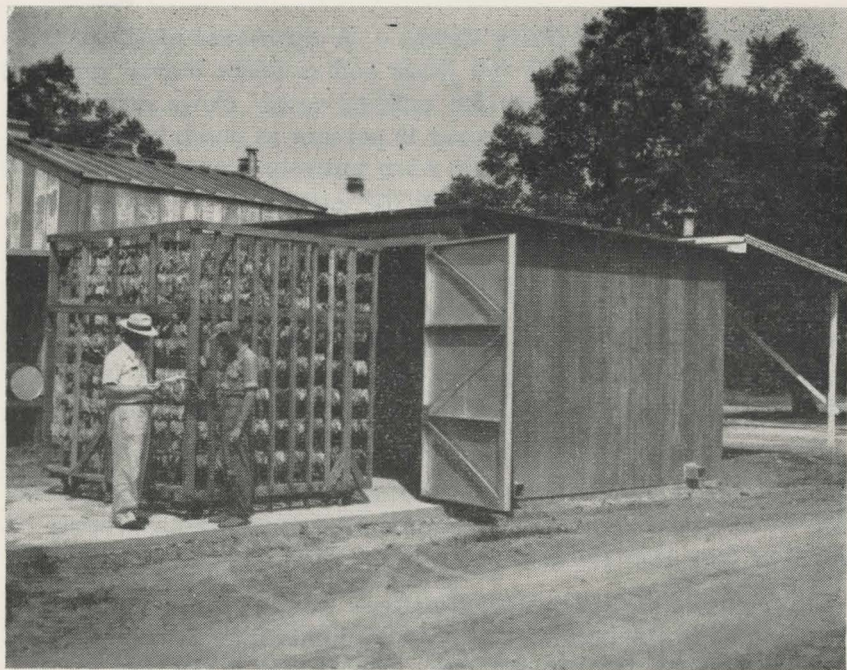


satisfactory results. Such a pasture in combination with winter grazing of rye grass and crimson clover provides a year-round pasture which, in the experiment, reduced the cost of feeding beef cattle by 50 percent as compared with dry-lot feeding. Further tests are being made to check rates of gain and per-acre beef production.

### Studies of Aromatic Tobacco Production

During the past few years the Station has carried on experiments in the growing and curing of aromatic (Turkish) tobacco with the view of encouraging its production in the Piedmont area. This tobacco is a new crop with definite advantages for small farmers in the area.

The success attending the introduction of this tobacco into the area is attested by the fact that the acreage in four or five years has increased from almost zero to about 300. With average yields



Curing Barn for Turkish Tobacco

of 700 to 900 pounds of tobacco per acre, the total production this year should approximate 200,000 to 275,000 pounds, worth at present prices \$160,000 to \$220,000.

### **Breeding of Mildew-Resistant Cucumbers**

The Station has recently introduced a mildew-resistant variety of cucumber, named Palmetto, which can be grown as a fall crop in the truck-growing area of South Carolina.

Because of downy mildew, the growing of fall cucumbers was a hazardous enterprise prior to the introduction of this variety, and only about 100 acres were usually grown in the state. Now about 1200 acres are being grown. Two years ago the crop from 700 acres was valued at \$289,000.

Unfortunately, this new variety is not adapted to production in the spring. A new variety known as Santee has been bred for meeting the requirements of spring production, and those who have observed it are highly optimistic as to its possibilities.

### **Non-toxic Fungicides for Treating Cottonseed**

Until recently the only materials available for treating non-delinted cottonseed were the highly poisonous mercury compounds. Surplus seed treated with such materials could neither be sold to oil mills nor fed to livestock.

Experiments by the Station have revealed that derivatives of 2,4,5 trichlorophenol are effective against cottonseed-borne disease and that the treated seed are not poisonous to cattle. Oil from treated seed has been found to be edible; however, the use of such oil in foods is not approved by the pure food authorities.

These fungicides are not effective for the control of seed-borne cereal diseases. New materials which may prove to be effective against such diseases as well as seed-borne diseases of cotton are being tested.

### **Study of Off-Flavors in Peaches Caused by New Insecticides**

With the introduction of benzene hexachloride for the control of certain insects, many reports began to be received of undesirable flavors in products which had received applications of this



insecticide. A notable case was the off-flavor imparted to Irish potatoes.

Reports were received also that peaches from trees sprayed with this material had an undesirable flavor. To obtain definite information, peaches which had been sprayed within seven weeks of harvesting with four benzene hexachloride compounds and with chlordane and parathion were processed in the Horticultural Products Laboratory at Clemson and examined for off-flavors by an adequate tasting panel.

It was found that neither chlordane nor parathion imparted any undesirable flavor; the benzene hexachloride compounds did so if used within five to seven weeks of harvesting. The off-flavor was more pronounced in the canned product than in the fresh or frozen fruit. The technical grades of benzene hexachloride gave a more pronounced off-flavor than did the refined material. It is now recommended that benzene hexachloride not be used in peach sprays later than the petal-fall and shuck-off applications.

### **Improving Dietary Practices**

A recent study by the Station attempted to determine some of the factors which influence food habits. The tests given to school children were designed to find what sorts of food combinations were regarded as acceptable (good combinations) for breakfast, dinner, and supper, and what combinations were considered unsatisfactory.

The investigation revealed that the parents, particularly the mother, were most influential in determining attitudes towards foods.

The conclusion drawn was that parents must be influenced to accept improved dietary practices if the younger generation is to receive the full benefits of them.

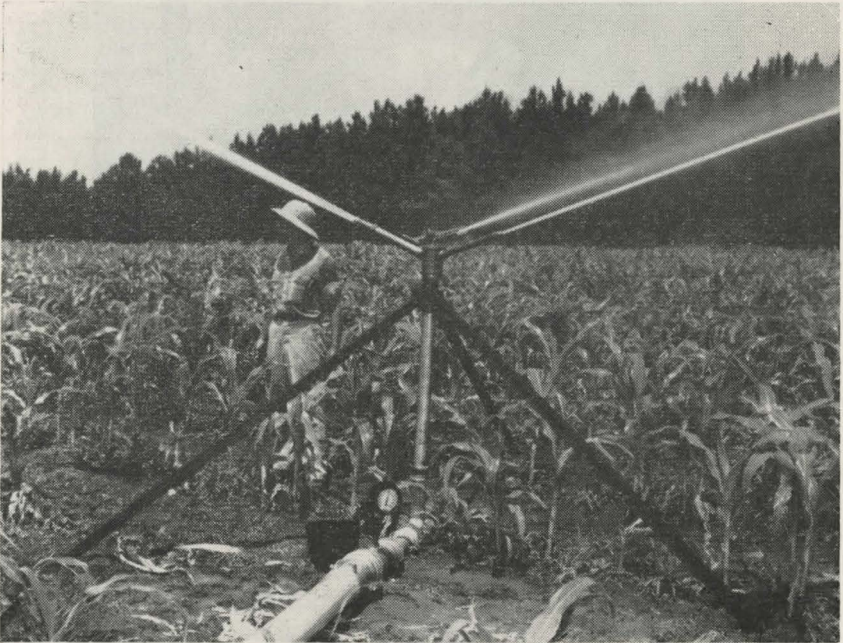
### **More Profitable Rations for Broiler Production**

Experiments by the Station for the production of broilers have revealed the economy of so-called high energy rations and the addition of antibiotics to the diet. "High energy" rations are those in which the fiber content has been reduced and the net energy



of the diet increased. Certain vitamin factors in the ration have also been increased, and the added antibiotics include aureomycin, streptomycin, and penicillin. Chicks started on the "high energy" ration produced 10 percent greater gains with 10 percent less feed than those started on a standard ration. Broilers produced with the "high energy" rations could be marketed a week earlier and produced at one to one and one-half cents per pound cheaper than those fed the standard ration.

The addition of aureomycin, streptomycin, and penicillin to the ration increased growth rate of the chicks over those fed the control ration up to 15 percent in certain instances. The feed to produce a pound of gain was approximately the same with all rations. The addition of these antibiotics to the broiler ration further shortened the time from day-old chick to market broiler.



Large Sprinkler for Irrigating Field Corn

### Irrigation Experiments

Recently there has been much interest in irrigation in South Carolina and experiments have been undertaken to determine the cost and value of applying supplemental water to several crops.



**Tractor-mounted Pump for Pasture Irrigation**

To date these experiments have indicated that irrigation of most of the crops under the tests may be quite profitable, corn, particularly, making considerably larger yields on the irrigated plots. On specialized crops, such as peaches and some of the vegetables, irrigation not only increases the yield but improves the size and quality of the product.



### Fence Post Preservation

A program to develop a simple and economical treatment for the preservation of fence posts was initiated at Clemson in 1939. A method of treating common pine posts with zinc chloride or chromated zinc chloride has been worked out whereby the life of such posts can be increased to at least eight times that of untreated posts at a cost, for the preservative, of less than ten cents for posts of average size. No special knowledge or equipment is required, and it is not necessary to peel the posts.



Treated Fence Posts Are Tested for Durability and Effect of Treating Chemical on Wire and Staples

In 1948, the program was enlarged to include some 30 common species of wood generally available in the state. All of the softwoods included responded readily to treatment, and many of the hardwoods showed promise. Extended service tests are being carried out with the treated posts to determine the value of the treatment for the different species of woods.

### Sesame Breeding Program

Because of its promise as a new oil-seed crop for the cotton belt, the breeding of sesame at Clemson has been expanded considerably during the past two years. The objective of the program is

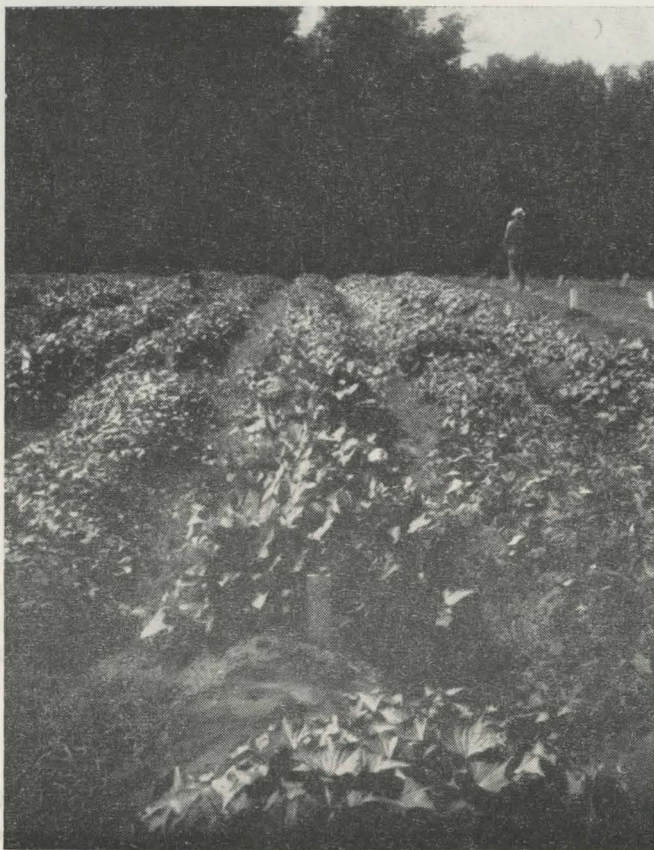


to develop and test non-shattering and even-maturing strains of sesame adapted to mechanized production in the Southeast.

The Station and the National Cottonseed Products Association are co-operating to further expand and speed up sesame improvement work. Some very promising breeding material in the experimental plantings will, it is confidently believed, provide the foundation for the development of desirable types which may be grown profitably on a commercial scale.

#### **Breeding New Varieties of Sweet Potatoes**

In limited tests at least three seedlings resulting from the sweet potato breeding program have been found to be superior to the



**New Strain of Sweet Potatoes in Center Row**

Porto Rico variety in wilt resistance, uniformity of color, freedom from cracking, ease of cultivation and harvesting, productivity, and baking quality. One of these new seedlings, designated as 8 A, produces an erect, vigorous, highly desirable type of growth adapted to tractor cultivation. At least one of the new seedlings will be introduced as a new variety when an adequate quantity of seedstock has been produced.

### Improving the Quality of Corn Meal

A program to improve the quality and nutritive value of corn meal is being carried on co-operatively by workers in the Experiment Station and the Extension Service.

Corn as it comes from the average crib on the farm needs to be cleaned before it is ground into meal. The Nutrition Department of the Experiment Station has designed a cleaner for this purpose, and 32 have been put into use during the past year. The larger mills in the state are using commercial corn cleaners, but the smaller ones need a relatively inexpensive machine, such as that developed by the Nutrition Department.

**REPORT OF DIRECTOR OF EXTENSION SERVICE**

Dr. R. F. Poole, President  
The Clemson Agricultural College  
Clemson, South Carolina

Dear Dr. Poole:

I am enclosing the Annual Report of the Extension Service prepared in accordance with the law which requires a report to be made through you to the Board of Trustees and on to the General Assembly of South Carolina.

Trusting that this is satisfactory, I am

Sincerely yours,

D. W. Watkins, Director

**The Clemson College Extension Service**

The purpose of Extension work is to carry to farmers, farm homemakers, and others, individually and in groups, the findings of research and experience in agriculture and home economics science, and assist them through practical demonstrations and otherwise in applying this information on their farms and in their homes to the end that they may build a safe, sound, and progressive agriculture and rural life.

**Progress in South Carolina Agriculture**

The year 1949 will go down in agricultural history as an unusual year for South Carolina farmers.

Cotton, still the most important single source of agricultural income for the state, suffered heavy damage as a result of a combination of unfavorable weather conditions. The mild winter of



1948-49 resulted in a new high record survival and spring emergence of boll weevils, and continued rainfall during the fruiting and harvesting season made effective control very difficult throughout the state. This continued rainfall also caused heavy damage to cotton bolls from boll rot and other diseases. The combination of cotton insect and disease damage reduced the average yield of lint cotton per acre from a 1944-1948 five-year average production of 348 pounds per acre, and a 1948 production of 372 pounds per acre, to 211 pounds per acre in 1949.

In addition, late cold weather reduced the commercial peach crop to 2,490,000 bushels, as compared with the high record production of 6,630,000 bushels in 1947.

It is estimated that these disasters caused a loss of \$75,000,000.

Only the fact that farmers had made substantial progress in balancing their farming systems with livestock, feed crops, and other income-producing crops, and in improving the efficiency of production in these enterprises, prevented this loss from being a major catastrophe for the state.

1949 was a favorable year for the production of feed crops and a number of cash crops. The continued rainfall, which was so disastrous to cotton, contributed to the production of high yields of feed crops and abundant grazing from pastures and forage crops. Corn production reached a new high record average of 22.5 bushels per acre, and a new high record total production of 31,590,000 bushels. The yield of 26 bushels of oats per acre equaled the third highest yield on record. Hay yields reached a new high average of 1,820 pounds per acre.

The 1949 yield of 1,330 pounds of flue-cured tobacco is the highest on record for the state. The average yield of 11 bushels of soybeans per acre and the total production of 275,000 bushels of soybeans established new high records. The average yield of 240 pounds of lespedeza seed per acre also set a new high record.

Cash income to farmers from livestock and livestock products continues to increase, reaching a new high figure of \$72,061,000 in 1949, and representing a new high record of 26 percent of the state's total farm income.

The number of hogs on farms increased 7 percent over the number on farms in 1948. Milk production reached a new high record of 3,940 pounds per cow, and a new high total production of 615,000,000 pounds in 1949. Development of the dairy industry is shown by the fact that, notwithstanding the increase in urban population, the annual volume of grade A milk produced is now sufficient, if properly distributed seasonally and geographically, to meet the consumer demand in the state.

Egg production per hen reached a new high level of 118 in 1949, and the production of 6,519,000 commercial broilers almost doubled the previous high record of 3,951,000 established in 1948. The production of turkeys also reached a new high record of 714,00 in 1949.

The progress of mechanization is shown by the fact that the number of horses and mules on farms reached a new low level of 172,000 in 1949, while the number of tractors on farms rose to a new high record of 25,867, and the number of trucks on farms reached a new high record of 28,209. Rural electric service was extended to reach a new high number of 120,000 farms.

These figures show that marked changes and adjustments are taking place in South Carolina agriculture. Farmers are making progress in their efforts to conserve and improve their soils. They are balancing their cotton, tobacco, and truck crops systems of farming with increased numbers of livestock per farm. They are increasing yields per acre and improving the quality of their crops. The quality of livestock, and the production of meat, milk, and eggs per animal is rising steadily. Efficiency in production is being advanced through the use of science, mechanization, and labor-saving practices. Farm homes and other farm buildings are being improved for comfort, efficiency, and general appearance. Farmers are gaining ground in their battle to build a safe, sound, and progressive agriculture and rural life.

### **The 1949 Agricultural Program for South Carolina**

Over 8,000 farmers, farm women, and others representing neighborhoods and communities in the 46 South Carolina counties, gave unselfishly of their time and efforts in serving on community and county agricultural committees, and on the State



Agricultural Committee, and assisting in the development of the agricultural program for South Carolina.

This program was a 15-point summary of what was considered necessary and wise practice on: 1. Farm Planning; 2. Soils; 3. Food and Feed; 4. Farm Mechanization; 5. Livestock, Dairying, and Poultry; 6. Cotton; 7. Tobacco; 8. Fruits and Vegetables; 9. Forestry; 10. Seeds and Plants; 11. Pests and Diseases; 12. Marketing Facilities; 13. Farm Buildings; 14. Farm Boys and Girls; 15. Health and Recreation.

### **Extension Activities and Results**

In carrying out the 1949 program of Extension work, county Extension agents made 116,076 farm and home visits to 67,205 different farms and homes. They supervised 10,874 result demonstrations by farmers and farm women showing the results of improved methods of farming and homemaking, and gave 23,282 method demonstrations to 454,762 farmers, farm women, and 4-H Club farm boys and girls, to show improved ways of doing farm and home jobs. County Extension agents held or took part in 33,934 educational and demonstration meetings which were attended by 947,382 farm people. They prepared 12,535 newspaper articles for publication and distributed 266,720 farm and home bulletins and other pieces of educational material. They made 2,494 radio broadcasts giving timely farm and home information. A total of 136,106 farm people came to county Extension offices, and 115,746 called by telephone for information and assistance.

**Agricultural Economics and Farm Management** Extension work included presentation of outlook and other economic information, farm planning and farm management demonstrations, landlord-tenant arrangements, farm family business agreements, and unit test demonstration farms in cooperation with TVA.

**Home Management and House Furnishings Extension Work** consisted of demonstrations in improving the furnishings, arrangement and efficiency of kitchens and other rooms, and the construction and remodeling of farm homes.

**Agricultural Engineering** Extension work was directed toward helping South Carolina farmers select and use farm and home machinery and equipment suited to their farms.



**Fruit and Truck Crops** Extension work consisted of home garden demonstrations for the family food supply, market gardens for additional income to the farm family, demonstrations of pruning and spraying orchards, orchard cover crops, orchard terracing, and commercial truck crops production.

**Farm Forestry** Extension program was conducted in cooperation with the South Carolina State Commission of Forestry, and included woodland examinations, demonstrations of marking timber for selective cutting, woodland management, timber thinning, use of improved forestry equipment, marketing timber products, fire control and reforestation.



Permanent pasture demonstrations were conducted on 555 South Carolina farms in 1949. County agents estimate 215,000 acres of permanent pastures established or improved according to recommendations. In addition, farmers produced 100,500 acres of summer grazing, and over 186,700 acres of winter grazing in 1949.

**Field Crops, Soils, and Fertilizers** work consisted of five-acre cotton contest demonstrations, tobacco production demonstrations, demonstrations in production of corn, small grains, peanuts, soy-

beans, lespedeza, permanent pastures, annual grazing, hay, and other crops, assistance in seed certification, taking soil samples for analysis, and in fertilizers and soils problems.

**Soil Conservation** Extension work, in cooperation with 33 soil conservation districts and the Soil Conservation Service, consisted of various educational methods to further the establishment of soil conservation practices on farms.

**Livestock** work included demonstrations in beef cattle, hogs and sheep production, based upon the foundation of improved permanent pastures, annual grazing and other home-grown feed crops. The number of hogs on farms in 1949 increased 7 percent over 1948 to reach 663,000. County agents report a new high record of 2,495 purebred beef bulls in use in 1949. Demonstrations were given in meat cutting and curing, control of livestock parasites and marketing livestock. South Carolina farmers sold \$40,499,000 worth of livestock and livestock products in 1949.

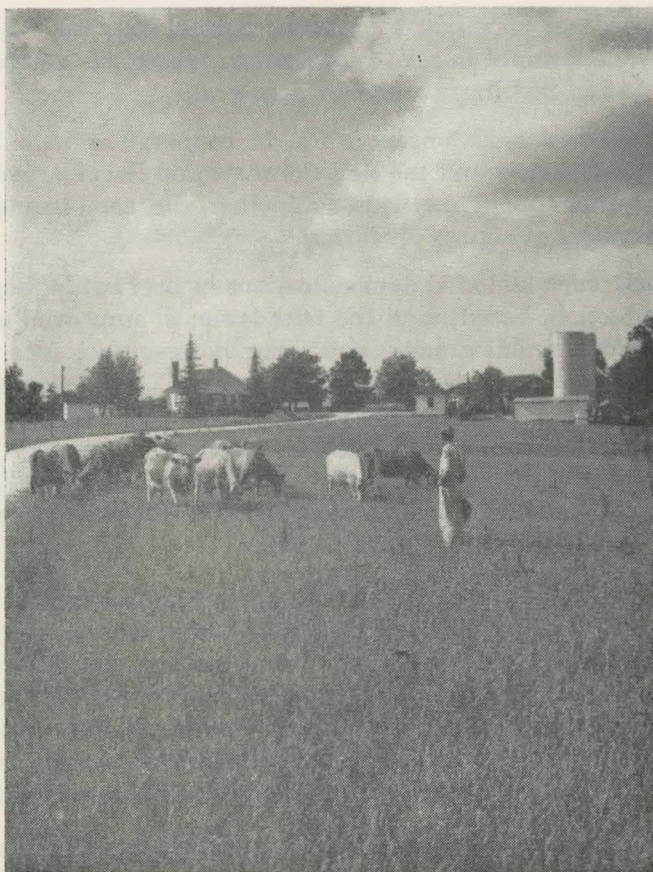
**Dairying** Extension work consisted of demonstrations in breeding and herd management, production of pastures, annual grazing and home-grown feeds, artificial insemination, and marketing dairy cattle and dairy products. Milk production per cow reached a new high record of 3,940 pounds, and the state's total milk production reached a new high record of 615,000,000 pounds in 1949. The total value of dairy products marketed in 1949 was \$13,692,000.

**Poultry** Extension work included demonstrations in poultry and turkey production, control of poultry and turkey diseases and parasites, establishment and operation of poultry dressing plants, and marketing poultry, turkeys, and eggs. Value of poultry, turkeys and eggs marketed in 1949 was \$17,360,000. Broiler production reached a new high record of 6,519,000, and egg production reached a new high record of 118 eggs per hen in 1949.

**Foods and Nutrition** Extension work consisted of demonstrations and assistance in improving food preparation practices, child feeding problems, and food selection.

**Food Preparation and Conservation:** Demonstrations and assistance were given farm families in producing, canning, freezing and curing foods, and to operators of freezer locker plants.





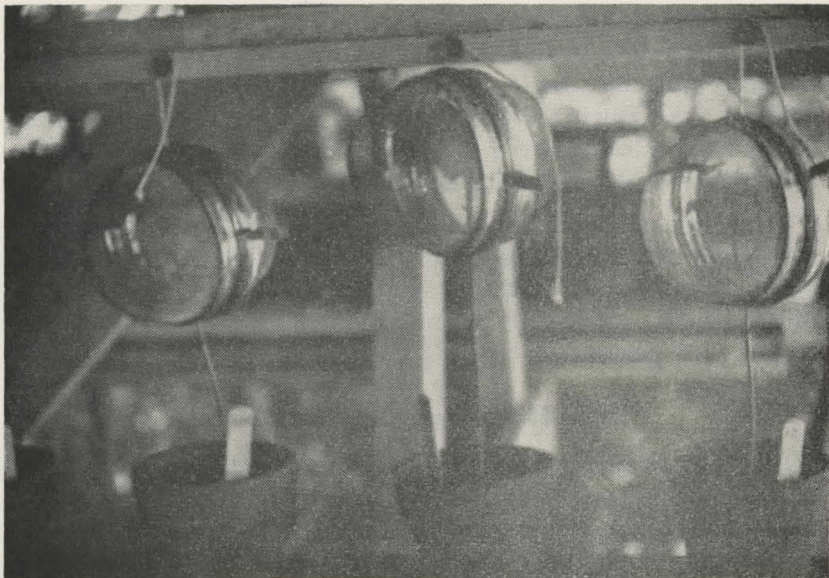
Average milk production per cow on South Carolina farms has increased steadily to reach a new high record of 3,940 pounds in 1949.

**Food Improvement** Extension work consisted of an educational program to encourage corn millers to enrich corn meal and grits, and people to use enriched foods.

**Rural Health** Extension work was carried out through home demonstration clubs, 4-H clubs, and otherwise. Farm people were encouraged to have health examinations. Safety programs, farm and home sanitation, and insect and rodent eradication programs were stressed.



**Insects, Diseases, and Pests:** Demonstrations in this line included treatment of cotton planting seed, control of boll weevil and other cotton insects and cotton diseases, treating cattle for flies, lice and grubs, spraying farm buildings to control flies, and control of weeds.



Test cage used to confine boll weevil adults on treated cotton plants

**Clothing and Textiles** Extension work consisted of assisting farm families in selection, care, repair, and storage of clothing, care and repair of sewing machines, and making slipcovers for furniture.

**Marketing** Extension work was directed toward assisting farmers in developing improved market facilities, and in efficient production, harvesting, grading, packing, and marketing products of diversification in a changing agriculture. Marketing activities included daily market news service to farmers, assistance to farmers in setting up and operating cooperative marketing associations and improved marketing facilities, and in marketing hogs, poultry, eggs, beef cattle, dairy products, seeds, and many other products of diversification to a new high record value of \$21,193,861.

**Four-H Club Work:** A new high total of 48,732 farm boys and girls were enrolled in 1,714 community 4-H clubs in 1949. Training of 4-H club members included farming, homemaking, community activities, health, citizenship and leadership. Four-H club boys and girls grew out livestock and crops, and girls carried out other activities for better farm family living.

**Publications and Radio** Extension program was aimed at distributing up-to-date farm and home information through newspaper articles, bulletins, radio broadcasts, circular letters, and other publications. During the year, 266,731 bulletins were distributed, 12,535 news stories were published, and 2,833 radio broadcasts were made on timely farm and home topics.

**Visual Instruction:** Educational motion pictures on agricultural and home economics subjects were shown at 1,833 meetings to 99,721 farm people. Other visual instruction included showing slides, charts, models of farm buildings and equipment, photographs, and posters.

### **The 1950 Program of Extension Work**

The 1950 Plan of Extension Work was planned and developed with the cooperation of the 46 county agricultural committees and the State Agricultural Committee. It is a summary of 15 specific points covering the range of Extension activities as follows: 1. Complete Farm Planning; 2. Food and Feed; 3. Soil Conservation and Improvement; 4. Farm and Home Equipment; 5. Livestock, Dairying, and Poultry; 6. Cotton; 7. Tobacco; 8. Fruits and Vegetables; 9. Forestry; 10. Seeds and Plants; 11. Pests and Diseases; 12. Marketing Facilities; 13. Farm Homes and Other Buildings; 14. Farm Boys and Girls; 15. Health and Recreation.

Thorough attention is being given to the needs and the possibilities for development and improvement of farming and rural life in each of these 15 points.

Note: A complete report of the work of the Clemson College Extension Service may be had by writing the Division of Publications, Clemson, South Carolina, for a copy of the publication entitled "Agricultural Progress in South Carolina, 1949".